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(54) **BRAKING INTENSITY INDICATOR SYSTEM INCLUDING SELECTIVE ADJUSTMENT OF BRAKE PEDAL LIGHT AND RELATED METHODS**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,639,126 B2 12/2009 Noh et al.
2002/0158757 A1 10/2002 Stubock

2005/0040702 A1* 2/2005 Yen B60Q 1/302
303/138
2006/0012471 A1* 1/2006 Ross, Jr. A42B 3/0453
340/479
2007/0241874 A1 10/2007 Okpysh et al.
2010/0102946 A1* 4/2010 Polak B60Q 1/525
340/467
2013/0168552 A1* 7/2013 Tsang G01J 1/0462
250/340
2013/0321143 A1 12/2013 Boyer
2014/0354422 A1* 12/2014 Olson B60Q 1/445
340/465
2015/0224922 A1* 8/2015 Kondou B60Q 1/44
340/479

OTHER PUBLICATIONS

STMicroelectronics, "Time-of-Flight (TOF) Proximity Sensor, Ambient Light Sensor (ALS) and IR Emitter, 3-In-1 Module," Doc ID 024288 REV 4, Jan. 2014, VL6180, 4 pgs.

* cited by examiner

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(57) ABSTRACT

A braking intensity indicator system for a vehicle of a type that includes a foot operated brake pedal and at least one brake light may include a proximity sensor to be associated with the brake pedal and a controller. The controller may be configured to cooperate with the proximity sensor to determine a plurality of brake pedal positions versus time during foot operation of the brake pedal, and selectively adjust an intensity of the at least one brake light based upon the determined plurality of brake pedal positions versus time.

23 Claims, 4 Drawing Sheets

